Intratumoral Hemorrhage From a Posterior Fossa Tumor After Cardiac Valve Surgery
—Case Report—

Keiichiro MAEDA, Hirohisa GOTOH*, Emiko CHIKUI, and Takehiko FURUSAWA*

Departments of Neurosurgery and *Cardiovascular Surgery, Suwa Chuou Hospital, Chino, Nagano

Abstract

A 53-year-old woman suffered intracranial hemorrhage from a cerebellar tumor several days after aortic valve replacement. Surgical intervention was not performed because the patient refused blood infusion for religious reasons (Jehovah’s Witness). Instead, the anticoagulation therapy was interrupted for a week, and the patient was conservatively treated with administration of mannitol and steroid. The anticoagulation therapy was restarted 7 days after the hemorrhage. The intratumoral hemorrhage did not recur, and no systemic embolism occurred. The tumor was treated with gamma knife radiosurgery 6 weeks after the hemorrhage, under the radiological diagnosis of meningioma. Anticoagulation therapy is routinely used for patients following cardiac surgery to decrease the risk of thromboembolic complications, but also increases the risk of hemorrhagic events which often involve the central nervous system. Temporary discontinuation of anticoagulation therapy is an option for intratumoral hemorrhage in patients with replacement heart valves, and patients with known brain tumors should be informed about the risk of intracranial hemorrhage before cardiac surgery.

Key words: meningioma, hemorrhage, anticoagulation therapy, cardiac surgery

Introduction

Patients with mechanical heart valves carry a high risk for systemic thromboembolism, which often affects the central nervous system. Anticoagulation therapy is routinely administered following valve replacement to prevent such catastrophic neurological complications, but also increases the risk of hemorrhagic complications in the central nervous system, which are associated with a mortality of approximately 60%. Here we report a case of intracranial hemorrhage which was caused by a pre-existing brain tumor in a patient receiving anticoagulation therapy immediately after cardiac valve replacement.

Case Report

A 53-year-old female underwent aortic valve replacement for aortic valve regurgitation on October 18, 1999. The operation was performed without blood infusion, which is forbidden by her religion (Jehovah’s Witness). She had no neurological deficit before surgery, and no neuroradiological investigations were done. She recovered from surgery uneventfully, and was given 10,000 units per day of heparin postoperatively for prevention of thromboembolic complications, which maintained the thrombo-test at about 20%.

Three days after the operation, she started to complain of headache and nausea, which gradually worsened. Computed tomography disclosed cerebellar hemorrhage with massive surrounding edema on October 26, 8 days after the surgery (Fig. 1). Magnetic resonance imaging with gadolinium obtained on the same day revealed an enhanced mass with attached dural tail, indicating that the tumor was most likely meningioma. Tumor removal by emergency surgery was considered too risky without blood transfusion, and she was treated conservatively with intravenous mannitol and steroid. Anticoagulation therapy was withheld for 7 days, then restarted initially with heparin and later replaced with warfarin. The patient’s symptoms gradually improved, accom-
Fig. 1 A: Computed tomography scan showing cerebellar hemorrhage surrounded by severe edema. B: Axial T1-weighted magnetic resonance (MR) image showing deformity of the fourth ventricle. C: Axial T2-weighted MR image showing severe edema in the right cerebellum. D: Axial T1-weighted MR image with gadolinium demonstrating a tumor adjacent to the dura with a dural tail. The central part of the tumor was not enhanced due to hemorrhage.

panned by radiological regression of the edema around the tumor. She made an excellent recovery and was discharged without neurological deficit on November 22, 1999.

The tumor was treated radiosurgically with the gamma knife on December 3, 1999. The follow-up examination 10 months after radiosurgery showed the tumor was stable in size, and no hemorrhagic event had occurred.

Discussion

Management of intracranial hemorrhage affecting patients with prosthetic heart valves can pose medical problems. Discontinuation of anticoagulants increases the risk for thromboembolic complications, whereas premature resumption of anticoagulant therapy may exacerbate the hemorrhage. A retrospective study of 26 patients with mechanical heart valves suffering from intracranial hemorrhage found that suspension of anticoagulant therapy for 1–2 weeks did not cause systemic embolic complications. In the present case, the hemorrhage occurred in the acute postoperative stage of cardiac valve surgery, and the risk for thromboembolic complications was probably higher. The prognosis for intratumoral hemorrhage is worse in general, with an estimated rate of rebleeding of about 25% without anticoagulation. Facing such a dilemma, we chose to suspend the anticoagulant therapy for a week, which resulted in an excellent outcome. Whether such an approach can be generalized is not clear. However, our case suggests that temporary interruption of anticoagulation therapy is an option in such a rare situation, even immediately after cardiac surgery.

Gastrointestinal bleeding frequently recurs after restart of anticoagulation. However, the risk of intracranial rebleeding following resumption of anticoagulation after 1–2 weeks is not high. In addition, the level of anticoagulation evaluated by the international normalized ratio or thrombo-test is not related to the risk of intracerebral hemorrhage. Nonetheless, close monitoring of the bleeding site by imaging studies is recommended for the first few days following the re-introduction of anticoagulation.

In our case, the tumor was most likely a meningioma, considering the typical radiological findings although unconfirmed histologically. Meningioma is an extremely rare cause of hemorrhage, with no previous experience of intratumoral hemorrhage following cardiac surgery. In our case, the anticoagulation was most likely the cause, but changes in intracranial pressure during the cardiac surgery might have contributed as well. Meningioma is one of the most common intracranial tumors, and few meningiomas are surgically treated after incidental detection because of the slow growth and benign clinical course. Our case indicates that patients with known brain tumors including meningiomas should be informed of the risk of intracranial hemorrhage when cardiac surgery is planned. A neurosurgical procedure may better be performed before cardiac surgery in patients with cardiac diseases who also have brain tumors.

References

1) Ananthasubramaniam K, Beattie JN, Rosman HS, Jayam V, Borzak S: How safely and for how long can warfarin be withheld in prosthetic heart valve patients hospitalized with a major hemorrhage?


---

*Address reprint requests to: K. Maeda, M.D., Department of Neurosurgery, University of Tokyo Hospital, 7–3–1 Hongo, Bunkyo-ku, Tokyo 113–8655, Japan.*